STANDARD SPECIFICATION FOR DIGESTER COVERS STEEL, FIXED & FLOATING

MOE SPEC. NO. 13

ISSUE NO. 2 SEPTEMBER, 1987

Ontario
Ministry of the Environment

The Honourable
Jim Bradley
Minister

Rod McLeod
Deputy Minister

ONTARIO MINISTRY OF THE ENVIRONMENT

STANDARD SPECIFICATION NO. 13 ISSUE NO. 2 SEPTEMBER, 1987

FOR

DIGESTER COVERS

STEEL, FIXED AND FLOATING

MINISTRY OF THE ENVIRONMENT
ENVIRONMENTAL APPROVALS AND LAND USE PLANNING
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ONTARIO MINISTRY OF THE ENVIRONMENT
STANDARD SPECIFICATION NO. 13, ISSUE NO. 2,
SEPTEMBER, 1987

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1.0 SCOPE, DESIGN, DOCUMENTS AND SUPPORTING INFORMATION:

1.1.0 Scope:

.1 This specification covers the general features of design, materials, manufacture, arrangement, protective coating, testing, shipment and commissioning of digester covers.

.2 This specification is limited to:

(a) Fixed and floating digester gas holder covers, fabricated from steel.

1.2.0 Design:

.1 Design, fabricate and assemble the equipment to ensure that it is adequately suited to the purpose for which it is used and that it complies with the basic requirements and information stated and referred to in Table I Data Form and this specification. Use good engineering practice and comply with the National Standards and Codes referred to in this specification.

All materials and equipment to be new and of current manufacture.

.2 Ensure that the dimensions, sizes and details indicated in Table II Data Form or on drawings are correct for the size of the equipment offered and meet the conditions indicated in Table I Data Form.

1.3.0 Substitution:

.1 Certain components in this specification are referred to by make and type and substitution is acceptable only as follows:

(a) If the component is specified as "Approved equal" to a specific make and type, no substitution is acceptable without written approval by the Ministry of the Environment.

(b) If the component is specified as "equal to" a specific make and type, a substitution will be considered provided it is listed in Table II Data Form deviations and provided it has a performance characteristic equal to that shown in the specification.

1.4.0 Alternatives

1 If a bidder wishes to offer an alternative proposal in addition to his proposal complying with this specification, set out clearly each such alternative and state the related price adjustment for each alternative.

1.5.0 Documents

.1 Read this specification in conjunction with the following documents:

(a) Invitation to Tender
(b) General Terms and Conditions (Nov. 1986)

(c) Form of Quotation
(d) Table I Data Form
(e) Table II Data Form

This specification, together with the above mentioned documents and any further documents issued therewith by the Ministry or its Consulting Engineers, comprise the quotation documents.

.2 Blank copies of Invitation to Tender and Tables I and II Data Forms are included in the Supplements for reference and will be completed for specific requirements of the digester covers as follows:

(a) Invitation to Tender: prepared by the Consulting Engineer.

(b) Form of Quotation: prepared by the Consulting Engineer to be completed by the Bidder.

(c) Table I Data Form: prepared by the Consulting Engineer.

(d) Table II Data Form: a questionnaire to be completed by the Bidder and returned with his quotation. Submit all information requested on this form in addition to supporting information, in order for the quotation to receive full consideration.

NOTE: In the supporting information, it is <u>not necessary</u> to submit a schedule of equipment equivalent to a copy of the Ministry's Technical Specification. Deletions, features additional to the specification, and

descriptive information only are required for consideration as supporting information.

1.6.0 Supporting Information

.1 Submit with the quotation a detailed description of the various items of work required to be performed by the Equipment Supplier or Subcontractor to install the equipment in the field. In particular, state the approximate lengths of horizontal and vertical welding necessary for field installation of the equipment. The cost of the various items of work so given for installing the equipment in the field will amongst other considerations, be part of the evaluation of a proposal.

.2 If it is found that the actual work required in the field to install the equipment is substantially greater than defined by the Equipment Supplier in his proposal, and if, in the opinion of the Engineer, such additional work should have been included in the proposal, the cost of such additional work will be charged against the Equipment Supplier.

2.0 STANDARDS

2.1.0 References:

.1 Wherever standards and regulations are mentioned in these specifications, they refer to the latest issues thereof.

2.2.0 Structural Standards

.1 In the design of the covers, allow for the testing pressures required by the current issue of CAN/CGA-B105-M, Installation Code for Digester Gas Systems issued by the Canadian Gas Association.

.2 Design the digester covers for the following loads and load combinations, as required by the Ontario Building Code, 1984 (OBC), Part 4, Working Stress Design.

1. Description of Loads

(a)	Dead Load	-D
(b)	Live Load (persons, maintenance, equipment, etc.)	-L
(c)	Snow Loads	-S
(d)	Internal Vacuum	-V
(e)	Wind Load	-W
(f)	Internal Pressure	-P
(g)	Unsymmetrical Load	-U
(h)	Temperature Effects	-T

2. Magnitude of Loads

D - weight of cover
L - 100 kg/m^2
S - 80% of local ground snow load according to OBC.
V - 50 kg/m^2
W - local wind load according to OBC based on 30 yr. return period, for the cover in any position.

P - based on CAN/CGA-B105-M testing requirements related to maximum operating pressure as specified on Table I Data Form.

U - snow load + wind load, both acting on half of the cover.

T - OBC

3. Load Combinations

(a) D
(b) D + L
(c) D + S
(d) D + V
(e) D + W
(f) D + U
(g) D + L + V
(h) D + S + V
(i) D + V + W
(j) D + L + V + W
(k) D + P
(l) D + P + W
(m) T - applied according to OBC

Load combination probability factors may be applied as follows:

Loading combinations (a) - (i) inclusive	1.0
Loading combination (j)	0.75
Loading combinations (k) & (l)	1.0
Loading combinations (m)	OBC

.3 Design all structural members to provide adequate strength and stability for the digester covers during all phases of construction with the maximum possible loadings.

.4 Ensure that the maximum stresses and deflections do not exceed the limits set forth in CSA S16.1, Steel Structures for Buildings.

.5 Upon award of this Contract, submit shop drawings and a design brief with calculations stamped and signed by a Professional Engineer registered in the Province of Ontario, showing conformity to this specification.

2.3.0 Material Standards

.1 For all structural steel used in the digester covers, use the highest grade structural steel for bridges; free from pits and rust, conforming to CSA Standard G40.21 Grade 300 W specifications.

.2 Provide a corrosion allowance 1.5 mm over and above the thickness required for the design loads on all steel plates and steel structural members.

.3 Minimum sheet steel thickness of the digester covers and skirts: 8mm.

2.4.0 Fabrication Standards:

.1 Fabricate the digester covers in accordance with CSA Standard S16.1, Steel Structures for Buildings and the manufacturer's instructions.

2.5.0 Welding Standards:

.1 Have all welding shielded arc conforming to CSA W59, Welded Steel Construction (Metal Arc Welding).

.2 Have all fabricating done by fabricators fully approved by the Canadian Welding Bureau to the requirements of CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.3 Have the extent of welding conform to the manufacturer's instructions.

.4 In addition to .3 above, provide a continuous weld inside the covers between any overlapping plates and between coverplates and all structural members and fittings in order to seal any void that may exist. The intent is to provide a sealed surface free from crevices which cannot be painted.

2.6.0 Safety Standards:

.1 Have the digester covers conform to the current issue of CAN/CGA-B105-M. Installation Code for Digester Gas Systems issued by the Canadian Gas Association.

3.0 EQUIPMENT SPECIFICATIONS:

3.1.0 Fixed Cover:

.1 Digester Dome:

(a) Construct each dome structure of prefabricated sub-assemblies which are set up

in the shop, match-marked, painted and knocked down for shipment to the site. Make the sections or pieces as large as practicable. Leave the miscellaneous connection members and appurtenances unassembled.

(b) If required, construct each dome for use with a gas digester mixing system. Provide flanged nozzled ports or discharge wells as required for the mounting of mixing assemblies. For a gas recirculation system, it is preferable to locate the gas compressor(s) inside the control building.

Provide discharge well shells as an integral part of the fixed steel cover. Evenly space .....* peripheral wells at a radius of....m* from the cover centre. (Locate a centre well adjacent to the gas dome). Fabricate well shells of 100 mm black steel pipe and install through the steel plate roof, terminating below the liquid level in the tank a sufficient distance to provide a positive gas seal. Extend the upper end of the wells above the cover roof line and provide with a gas tight bolted cover plate with lifting handle. Securely fix the gas well shell adjacent to the radial ribs of the steel digester cover and adequately brace them against lateral movement of the immersed injection lance.

Equip each discharge well shell with a 50 mm inlet connection and an internal seat ring to receive the discharge pipe assembly.

* Variable, depending on digester diameter.

(c) Fabricate the digester dome with a structural steel frame of radial structural ribs, cross-beams, rim angle and an internal skirt covered with arched steel dome plates. The structural frame may be above or below the dome plates, with preference given to the frame being above the dome plates.

(d) Provide an internal peripheral skirt of 1.8 m minimum height attached to the dome at the rim angle and extending down into the tank a sufficient depth to provide a water seal of not less than 760 mm at maximum gas test pressure. Have the skirt extend above the liquid surface a sufficient length to provide a freeboard of at least 915 mm from liquid level to the top of the concrete digester wall. Provide the skirt with a retaining plate so that the annular space between the skirt and the tank wall may be caulked with oakum to seal the lower part of the cavity and Domtar Type 3 roofing asphalt applied at the liquified temperature to a minimum depth of 75 mm to form the seal.

(e) Number of covers - as specified in Table 1 Data Form

(f) Tank dimensions - as specified in Table 1 Data Form

(g) Normal internal gas pressure - as specified in Table 1 Data Form.

.2 Support Brackets:

(a) Provide all support brackets and anchor bolts for anchoring the cover to the digestion tank.

(b) Have the support brackets welded to the dome supporting members and suitably reinforced to transfer the loading from the cover to the tank wall without overstressing the concrete or distorting the cover's skirt.

(c) Provide neoprene-bearing pads of suitable size and hardness for installation under each support bracket. Minimum thickness of neoprene pad - 38 mm.

(d) Design the bracket and pad assembly such that under no condition does any portion of the supporting bracket come in contact with the concrete wall. Have the assembly provide for expansion and contraction of the cover.

(e) Ensure that all anchor bolts are no closer than 150 mm from either face of the wall.

3.2.0 Floating Gas Holder Cover:

.1 Gas Holder:

(a) Have each gas holder made up of prefabricated sub-assemblies which are set up in the shop, match-marked, painted and knocked down for shipment to the site. Make the sections or

pieces as large as practicable. Leave the miscellaneous connection members and appurtenances unassembled.

(b) Design each gas holder such that a sufficient quantity of gas will be trapped beneath the domeplate so that it will ride on gas without the possibility of digester liquor covering any part of the dome plate.

(c) Provide each gas holder with top and bottom rollers mounted on the skirt and engaged in guides set in the concrete wall of the tank or an equivalent system, to insure that the gas holder will be level and free to move at all times.

(d) Design the skirts on the floating covers with sufficient depth to provide a minimum submerged water seal depth of 460 mm under all operating conditions.

(e) Number of covers - as specified in Table I Data Form.

(f) Tank dimensions - as specified in Table I Data Form.

(g) Required net effective gas storage volume as specified in Table 1 Data Form.

.2 Ballast

(a) Inside the skirt of each cover, weld a steel support trough which will be filled with

concrete, by others, so that a normal internal gas pressure as specified in Table 1 Data Form will be maintained.

(b) State the amount of concrete required and provide troughs large enough to accept same.

3.3.0 Gas Bonnet:

.1 Equip each digester cover with a gas bonnet, 1.0 m diameter minimum, to serve as a point of digester gas collection and removal, and to support the housing enclosure described in Section 3.4.5.

.2 Provide each gas bonnet with the necessary flanged connections for gas line take-off and gas safety equipment, and a bolted and gasketed cover.

3.4.0 Gas Safety Equipment:

.1 For each digester cover, provide two automatic pressure vacuum relief assemblies with flame arrestors installed upstream.

.2 Operation of the relief assembly - unless specified otherwise in Table 1 Data Form, set the relief valves to function at a positive pressure of 3 kPa (12" W.C.) and at a negative pressure of 0.4 kPa (1½" W.C.)

Use two Varec Fig. 2020 pressure vacuum relief assemblies with teflon seats and Fig. 50-91 flame arresters or approved equal, sized to the gas

capacity of the digester, but not less than 75 mm diameter. Mount the two assemblies on the top of each gas bonnet, enclosed in a suitable housing. Vent the assemblies to atmosphere.

.4 Provide one CGA approved three-way change over lubricated plug valve between the pressure vacuum relief assemblies and the digester gas bonnet, so that a flame arrester and pressure vacuum relief assembly is in effective service at all times.

.5 For each digester cover, provide a housing enclosure to protect the pressure vacuum relief valves from freezing. Provide the housing of aluminum, stainless steel or fibreglass construction, internally insulated with glass fibre insulation, 50 mm thick minimum, with a hinged access door and ventilator, suitable for mounting on top of the gas bonnet. Provide all hinges, latches and bolts of stainless steel or equal.

.6 Size the housing 2 m diameter minimum, to provide 450 mm space minimum around the relief valves for servicing and a minimum standing height of 1.8 m.

3.5.0 Cover Fittings:

.1 For each digester cover larger than 15 m diameter, provide one 1.1 m diameter bolted gas-tight manhole and cover and two 915 mm diameter non-sparking, gas-tight manholes with quick opening covers and locking devices for access to the digester and provide two 200 mm sampling wells with non-sparking, gas-tight, quick-opening covers. Extend the sampling wells to the bottom of the rim skirt.

.2 For each digester cover less than 15 m diameter, provide one 1.1 m diameter bolted gas-tight manhole and cover and one 915 mm diameter non-sparking, gas-tight manhole with quick opening cover and locking device for access and two 200 mm sampling wells with non-sparking, gas-tight, quick opening covers. Extend the sampling wells to the bottom of the rim skirt.

.3 Locate two of the manholes on the tank peripheries 180° apart.

.4 Provide a walkway from the access point at the perimeter of the cover to the pressure relief valve housing system, sampling wells and mixing equipment. Design the walkway for a minimum width of 750 mm and a minimum loading of 4.8 kPa (100 psf). Provide a handrail along one side of the walkway. Make the handrailing and posts of anodized aluminum alloy type 6062-T6 conforming to CSA HA7 extruded seamless tube 38 mm (1-1/2") D14 IPS Schedule 40. Have the fixing plates 100 x 10 mm alumimum 6062-T6 alloy. Fabricate the handrail to CSA S244 and W47.2 ensuring that the welding is smooth with an even finish.

.5 Provide the gas draw-off line and supports to the roof periphery.

4.0 INSPECTION AND COMMISSIONING:

4.1.0 General:

.1 Provide a factory-trained service representative to inspect the installation of the digester covers and

to be present at the initial operation. Specify the number of site visits included in the quotation and also quote a rate per diem.

.2 Instruct the operating personnel in the operation and maintenance of the equipment.

4.2.0 Testing:

.1 Before the digester covers are painted and put into service, they will be subjected to pressure and leakage tests in accordance with the current issue of CAN/CGA-B105-M, Installation Code for Digester Gas Systems issued by the Canadian Gas Association.

.2 The covers must show no evidence of leaking or structural deformation during the tests.

.3 Testing - by "others" unless otherwise specified in Table I Data Form.

5.0 PAINTING, PACKING AND SHIPMENT:

5.1.0 Painting:

.1 Surface Preparation - interior and exterior

(a) Provide near white surface preparation of all ferrous components by blast cleaning in accordance with the requirements of Steel Structures Painting Council SSPC-SP10.

(b) Have the workmanship standards of paint handling, paint application, temperature and moisture control and drying conditions comply with the requirements of Structural Steel Painting Council SSPC-PA-1.

(c) Remove all deposits of oil, grease and foreign matter by power wire brushing, solvent or chemical cleaning.

.2 Shop Prime Coat to Metal Surfaces

(a) Inform the purchaser in sufficient time ahead of the date of application of the primer so that the purchaser may, if he so wishes, send his representative for the inspection of the surface preparation.

(b) Apply one coat of weldable zinc rich primer, Carbo Weld 11 or equal, to all surfaces to dry a film thickness of .75 - 1.0 mils except within 75 mm of all seams to be field welded.

(c) After shop welding, clean the welds by wire brushing or blast cleaning to SSPC-SP3. Prime the welds and damaged areas with a polymide cured epoxy, Carboline 193 or equal, to a dry film thickness (DFT) of 1.0 to 1.5 mils.

5.1.3 Field Painting

(a) After field welding, clean the welds by wire brushing or blast cleaning to SSPC-SP3.0. Prime the welds and damaged areas with Carboline 193 or equal to a DFT of 1½ mils minimum.

(b) To submerged and internal areas, apply first coat of coal tar epoxy, red Carbomastic 14 or equal to a DFT of 5 - 6 mils. When dry, apply second coat of black Carbomastic 14 or equal,

to a DFT of 6 - 8 mils. Finish coat the external area of the skirt prior to assembly into the tank.

(c) To external areas, apply an intermediate tie coat of Rustbond 8HB or equal to a DFT of 2½ mils minimum. Apply a finish coat of grey long oil soya alkyd resin to a DFT of 2 mils minimum.

The above named products, Carbo Weld 11 Carbolene 193 and Carbomastic 14 are supplied by the Corrosion Service Co. Ltd. of Toronto, Ontario.

5.1.4 Paint Application

(a) Apply the prime coat within 24 hours of blast cleaning of surfaces. Allow field primer and intermediate coat to dry for at least 24 hours before recoating.

(b) On the exterior, provide a minimum total dry coating thickness for all coats of 6 mils, regardless of the dry coating thickness of preceding coats. If necessary to obtain the required total coating thickness, apply additional coats of the specified field finish coat material at the Contractor's expense.

(c) Apply paint to interior surfaces of the tank by airless spray equipment, and to exterior surfaces by a brush or roller. Use an approved dry coating thickness gauge to measure coating thickness after allowing 24 hours for drying.

5.2.0 Packing:

.1 Provide suitable packing to protect the equipment against frost, corrosion, dampness, heavy rain, breakage or injury, or loss of components during transit to its destination.

.2 Ensure that the packing is acceptable to the transportation companies.

5.3.0 Shipment:

.1 Do not ship the equipment from the shop except by prior agreement with the consulting engineer and the purchaser.

6.0 DRAWINGS AND MANUALS REQUIRED:

NOTE: The word "Purchaser" in this Section means the party who issued the purchase order to the supplier.

6.1.0 Information Required:

.1 Provide the following:

(a) Installation shop drawings.
(b) Installation instructions.
(c) Maintenance instructions.

6.2.0 Installation Shop Drawings:

.1 Include the following:

(a) General Arrangement

6.3.0 Information on Shop Drawings:

.1 Include the following:

(a) MOE Project Name and No.
(b) Supplier's Name, Order No. and Certifying Signature.
(c) Drawing No., Issue No. and Date of Issue.

6.4.0 Installation Instructions:

.1 Provide instructions applying specifically to the equipment supplied.

6.5.0 Distribution of Shop Drawings & Installation Instructions, Etc.:

.1 Unless otherwise directed by the consulting engineer, forward five (5) sets of shop drawings and instructions to the purchaser with a transmittal sheet including the following information and directions required by the Ministry:

(a) Mark sheet "Shop Drawings and Installation Instructions, Etc.".
(b) MOE Project No., Name and Jobsite, etc.
(c) One (1) set to be retained by the purchaser.
(d) Three (3) sets to be forwarded by the purchaser to the consulting engineer.
(e) Request the consulting engineer to indicate his approval or his comments and return two (2) sets to the purchaser.
(f) Of the three sets held by the purchaser, one (1) set approved or "noted" by the consulting engineer to be returned to the supplier, and

the remaining two (2) sets passed to the jobsite resident engineer who will hand them to the operating staff.

.2 The purchaser to take up any comments made by the consulting engineer and resolve the issues to the satisfaction of the engineer.

.3 Place one set of Shop Drawings and Installation Instructions, etc., in a stiff cover folder marked "CONSTRUCTION COPY. DO NOT REMOVE FROM SITE". This copy to be shipped with the equipment and retained with the accessories.

ONTARIO MINISTRY OF THE ENVIRONMENT
TABLE I DATA FORM
FOR
DIGESTER COVERS

MOE Project No.: _____

Location and Jobsite: _____

_____

NOTES: (a) This Table, prepared by the consulting engineer, covers the specific requirements of the equipment for the above project.

(b) Quotations must be in accordance with the Ministry's Standard Specification No. 13, Issue No. 2, dated September 1987 and as supplemented by this Data Form.

(c) Each quotation must be accompanied by a properly completed Table II Data Form.

(d) See Clause 1.4 regarding alternatives.

(e) See Clause 1.5.2(d) regarding supporting information.

DI.1.0 Design Data:

.1 Number of Digestion Tanks: _____

.2 Tank Dimensions:

(a) Diameter: _____

(b) Side Water Depth: _____

DI.2.0 Digester Cover Data:

.1 Type of Cover: Fixed/Floating Gas Holder (cross out the term which does not apply)

.2 Number of Covers Required: _____

.3 Normal Internal Gas Pressure: _____ kPa

.4 Maximum Operating Gas Pressure: _____ kPa

.5 Required Net Effective Gas Storage Volume per Unit (if applicable): _____ m^3

.6 Special Requirements:

DI.3.0 Gas Safety Equipment:

.1 Operating Points for Pressure Vacuum Relief Assembly:

_____ kPa pressure _____ kPa vacuum.

.2 Size _____ mm

.3 Special Requirements:

DI.4.0 Miscellaneous Details:

.1 Testing: By others/Equipment Supplier

Issued By: _____

Date: _____

ONTARIO MINISTRY OF THE ENVIRONMENT

TABLE II DATA FORM
FOR
DIGESTER COVERS

MOE Project No.: _____

Location and Jobsite: _____

DII.1.0 Bidder's Reference:

.1 Bidder's Name, Address and Phone Number: _____

_____

.2 Bidder's Quotation No. and Date: _____

DII.2.0 Digesters Covers:

.1 Number of Covers: _____ Type: _____

.2 Cover Dimensions:

(a) Diameter: _____ m

(b) Skirt Depth: _____ m

.3 Country of Assembly: _____

.4 Net Weight (approx.): _____ kg

.5 Steel Plate Thickness: _____ mm

.6 Length (approx.) of Field Welding Required:

(a) Horizontal: _____m

(b) Vertical: _____m

(c) Overhead _____m

.7 Quantity of Concrete Ballast (if applicable):

.8 Outline Drawings Enclosed: #_____

DII.3.0 Gas Mixing (if required)

No. of discharge wells _____

Radius from cover centre _____m

DII.4.0 Gas Safety Equipment:

.1 Pressure Vacuum Relief Assembly Make and Model No._____

.2 Operating Points:

_____ kPa pressure _____kPa vacuum

.3 Outline Drawings of Gas Safety Equipment and Equipment Housing Enclosed: #_____

DII.5.0 Deviations:

.1 List all exceptions to the specification. State "See separate sheet/letter OR "NO DEVIATIONS", whichever applies _____

_____

DII.6.0 Alternatives: State "See separate sheet/letter" OR "None Proposed", whichever applies

Submitted By: _____

Signature and Date: _____

MINISTRY OF THE ENVIRONMENT

F O R M O F Q U O T A T I O N

(See General Terms & Conditions for Preselected Equipment Clause GT2)

BY: _____

_____

TO: MINISTRY OF THE ENVIRONMENT, c/o _____

_____

FOR - MOE PROJECT NO. _____ CONTRACT NO. _____

_____

COVERING _____

_____

Q1.0 We, the above-named equipment supplier, having carefully examined the quotation documents issued by the Ministry's Consulting Engineer, including the General Terms and Conditions, Specifications and other related documents, if any, (see Clause Q4.0 below) herewith submit in duplicate and in accordance with the terms and conditions set out in the aforementioned documents our quotation for the equipment listed hereinafter.

Q2.0 We agree that, in case of any conflict between any of the terms and conditions set out in the documents which we submit together with this Form of Quotation and the terms and conditions set out in the quotation documents issued by the Ministry's Consulting Engineer, the provisions of the latter documents shall take precedence and shall govern.

Q3.0 We agree to the following requirements as noted in the Ministry of the Environment's General Terms and Conditions for Preselected Equipment, dated October, 1975:

.1 Validity period of this Quotation per Clause GT4.1 shall be _____ months from closing date for quotations of _____.
.2 Manuals, Parts lists, etc., per Clause GT 9.0, _____ sets to be supplied.
.3 Drawings per Clause GT 14.0, _____ prints to be supplied.
.4 Services Required at Site per Clause GT 16.0: The Supplier shall be responsible for: -

Minimum Requirements
No. of man days _____ No. of visits _____.

Q4.0 The quotation documents include the Ministry of the Environment's standard General Terms and Conditions for Preselected Equipment dated November 1986, this Form of Quotation, _____

_____

Q5.0 EQUIPMENT QUOTATION LIST

.1 Item Description	
.2 Item Ref. Letter	
.3 Quantity	
.4 TOTAL PRICE for above item f.o.b. jobsite, Sales Taxes excluded.	
.5 Total price valid until	
.6 Delivery of Equipment - weeks (After receipt of order)	
.7 Shop Drawings in weeks	
Commissioning of Equipment	
.8 No. of man days in total price	
.9 No. of men/No. of visits	
.10 Extra price per man day for further commissioning	
Breakdown of Imported portion	
.11 Part imported	
.12 Country of Origin	
.13 Percentage of Total Price at point of Entry	
.14 Rate of Import Duty	
.15 Rate of Exchange	

(Name of Quotation Preparation Officer)

(Name & Signature of authorized signing officer)

(Date)

Affix Co. Seal